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ASTM F853-2005: Standard Practice for Maintenance Procedures for Amusement Rides and Devices
as required by:
Commonwealth of Virginia, 13 VAC 5-31-40(A)(2)
State of Indiana, 685 IAC 1-2-3
State of Illinois, 56 IAC 6000.15(a)(1)(D)
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Standard Practice for Maintenance Procedures for Amusement Rides and Devices[1]

This standard is issued under the fixed designation F 853; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice establishes information for maintenance procedures of amusement rides and devices.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

F 846 Guide for Testing Performance of Amusement Rides and Devices

F 893 Guide for Inspection of Amusement Rides and Devices

F 1159 Practice for Design and Manufacture of Patron Directed, Artificial Climbing Walls, Dry Slide, Coin Operated and Purposeful Water Immersion Amusement Rides and Devices and Air-Supported Structures

F 1193 Practice for Amusement Ride and Device Manufacturer Quality Assurance Program and Manufacturing Requirements

F 2291 Practice for Design of Amusement Rides and Devices

3. Significance and Use

3.1 The purpose of this practice is to delineate information for the maintenance of amusement rides and devices.

4. Manufacturer's Responsibility

4.1 The manufacturer of an amusement ride or device shall provide, with delivery of each ride or device, documented maintenance instructions in the English language. These instructions shall include, but not be limited to, the following:

4.1.1 Description of the ride or device operation, including the function and operation of its major components.

4.1.1.1 Description of the designed motion(s) of the ride or device during operation.

4.1.2 Description of the recommended procedures for installation, setup, disassembly, and transportation of an amusement ride or device, where applicable.

4.1.3 Recommended lubrication procedures for the amusement ride or device.

4.1.3.1 Recommended types and specifications of lubricants.

4.1.3.2 Recommended frequency, and if applicable, quantity of lubrication.

4.1.3.3 A lubrication drawing, chart, or instruction, showing the location of lubrication points.

4.1.3.4 Recommended application method of lubrication.

4.1.4 Description of the recommended daily, preopening inspections to be performed.

4.1.5 Description, including frequency, of recommended maintenance inspections and testing, other than daily preopening inspection.

4.1.5.1 Recommended wear limits or tolerances, where deemed necessary by the manufacturer.

4.1.5.2 Recommended operational testing as specified in Guide F 846.

4.1.5.3 Where applicable, recommended nondestructive testing (NDT) as specified in Guide F 846.

4.1.5.4 Tests recommended pursuant to 4.1.5 shall meet the following criteria:

(*1*) The tests shall have been performed satisfactorily by the manufacturer prior to the sale of the amusement ride or device,

(*2*) The test shall be a test which the amusement ride or device, or element, can reasonably be expected to pass during the expected life of the amusement ride or device, or element, assuming recommended maintenance and operating procedures have been followed,

(*3*) The test shall be a test that is reasonable, and which the owner/operator can reasonably be expected to be competent to perform or cause to be performed.

[1] This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.30 on Maintenance and Inspection.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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4.1.6 Recommended specifications for the use of replacement fasteners, and recommended torque requirements for fasteners, where applicable. If appropriate, precautionary information will be provided relating to the continued use of fasteners that have been loosened or retorqued.

4.1.7 Schematics of electrical power, lighting, controls, and other systems, including location charts and manufacturer's troubleshooting guide, where applicable.

4.1.7.1 Description of recommended maintenance procedures for electrical components.

4.1.7.2 The name of the component manufacturer and appropriate identification number or specifications, or both, shall be provided for electrical components used within the amusement ride or device.

4.1.7.3 Each electrical component used within the amusement ride or device shall be assigned an individual identification number, symbol, or code to facilitate its location and identity on the electrical schematics.

4.1.8 Schematics of hydraulic and pneumatic systems, including recommended pressures, location of components, line specification, fitting specification, type of fluid, location chart, and manufacturer's troubleshooting guide.

4.1.8.1 Description of recommended maintenance procedures for hydraulic and pneumatic systems and components.

4.1.9 List of parts used in the assembly of the ride or device, or drawings showing component parts and their use.

4.1.10 Recommended procedures to be followed in the event of an extended period of non-operation or storage, or both.

4.1.11 Description of recommended assembly and disassembly techniques and procedures, pertaining to specific components, as deemed necessary by the manufacturer.

4.1.12 Recommended restrictions and special procedures, lubricants, materials, or equipment that may be necessary because of environmental conditions.

4.1.13 Other recommendations known to the manufacturer and specific to certain serial numbered rides or devices.

4.1.14 Supplemental notification bulletins delivered by the manufacturer of an amusement ride or device to the owner/operator that were not provided at the time of sale and contain new information or newly recommended inspections or testing, or both, shall be consistent with the following criteria in order to carry the force and effect of this practice:

4.1.14.1 Modifications, procedures, testing, or inspections shall conform to Guides F 846 and F 893, and Practices F 1159, F 1193, and F 2291.

4.1.14.2 Modifications, procedures, testing, and inspections shall be reasonable, ethical, and consistent with the general manufacturing practices within the industry.

4.1.14.3 Supplemental notification bulletins when used shall have a page header that contains the following information, when available:

(*1*) The name, address and telephone number of the issuing entity,

(*2*) The date the bulletin is released,

(*3*) The date the bulletin takes effect,

(*4*) The period the bulletin recommends for completion,

(*5*) The name of the original ride or device manufacturer,

(*6*) The name of the ride or device,

(*7*) The model number of the ride or device,

(*8*) The serial numbers of the affected rides or devices,

(*9*) The applicable dates of manufacture for the affected rides or devices,

(*10*) A number that uniquely identifies the bulletin,

(*11*) The number of the superseded bulletin, where applicable, and

(*12*) The page number and number of total pages.

4.1.14.4 The first page shall contain, in large bold upper case letters, one of the following titles:

(*1*) "SAFETY ALERT" for notifications that recommend immediate action (see Fig. A1.1),

(*2*) "SERVICE BULLETIN" for notifications that do not recommend immediate action but do recommend future action (see Fig. A1.2), and

(*3*) "NOTIFICATION" for notifications that do not necessarily recommend future action but are primarily for promulgation of information (see Fig. A1.3).

4.1.14.5 The first page shall contain a summary of the information contained in the body of the bulletin.

4.1.14.6 The first page shall summarize the reason(s) that prompted the release of the bulletin.

4.1.14.7 The first page shall list the recommended action to be taken, for example: Inspection, modification, part replacement, new parts, nondestructive testing, procedural change, manual revision, operational revision etc.

4.1.14.8 The remainder of the first page and any supplemental pages shall contain text detailing the information being promulgated. Drawings and diagrams may be used for clarification where applicable.

4.1.14.9 The supplemental notification bulletin, when printed, shall be in black ink on white paper. The following colored ink may be used to print titles:

(*1*) Red—for safety alert,

(*2*) Blue—for service bulletins, and

(*3*) Green—for notifications.

4.1.14.10 The supplemental notification bulletins shall follow the format provided in Annex A1.

5. Replacement Parts for Amusement Rides and Devices

5.1 Replacement parts for amusement rides and devices shall be:

5.1.1 Procured from the original manufacturer of the amusement ride or device, using the appropriate manufacturer-supplied identifying nomenclature; or

5.1.2 Procured or produced using appropriate original manufacturing drawings or specifications, or both, if available; or

5.1.3 Procured or produced using specifications derived from sufficient analysis to ensure parts of equivalent functions and quality, to those provided by the original manufacturer and in accordance with Practice F 1193.

5.2 The manufacture of replacement parts for amusement rides or devices shall conform to the applicable sections of Practices F 1159 and F 1193.

6. Owner/Operator's Responsibility

6.1 Each owner/operator of an amusement ride or device shall read and become familiar with the contents of the manufacturer's maintenance instructions and specifications when received, as provided in 3.1. Based on the manufacturer's recommendations, each owner/operator shall implement a program of maintenance, testing, and inspection providing for the duties and responsibilities necessary in the care of each amusement ride or device. This program of maintenance shall include a checklist to be made available to each person performing the regularly scheduled maintenance on each ride or device. The owner/operator's checklist (on a ride-by-ride basis) shall include but not be limited to:

6.1.1 Description of preventive maintenance assignments to be performed.

6.1.2 Description of inspections to be performed.

6.1.3 Special safety instructions, where applicable.

6.1.4 Any additional recommendations of the owner/operator.

6.2 The owner/operator of the amusement ride or device shall provide training for each person performing the regularly scheduled maintenance on the ride or device, pertaining to their assigned duties. This training shall include, but not be limited to, the following:

6.2.1 Instruction on inspection and preventive maintenance procedures.

6.2.2 Instruction on the specific duties of the assigned position.

6.2.3 Instruction on general safety procedures.

6.2.4 Demonstration of the physical performance of the assigned regularly scheduled duties and inspections.

6.2.5 Supervised observation of the maintenance person's physical performance of their assigned regularly scheduled duties and inspections.

6.2.6 Additional instructions deemed necessary by the owner/operator.

6.3 Prior to carrying passengers, the owner/operator shall conduct or cause to be conducted a daily documented and signed preopening inspection, based on provided instructions, to ensure the proper operation of the ride or device. The inspection program shall include, but not be limited to, the following:

6.3.1 Inspection of all passenger-carrying devices, including restraint devices and latches.

6.3.2 Visual inspection of entrances, exits, stairways, and ramps.

6.3.3 Functional test of all communication equipment necessary for the operation of the ride.

6.3.4 Inspection or test of all automatic and manual safety devices.

6.3.5 Inspection or test of the brakes, including service brakes, emergency brakes, parking brakes, and back stops.

6.3.6 Visual inspection of all fencing, guarding, and barricades.

6.3.7 Visual inspection of the ride structure.

6.3.8 The ride or device shall be operated for a minimum of one complete operating cycle.

6.4 An amusement ride or device, or the specifically affected element, shall be appropriately inspected and operated, without passengers, to determine that it is functioning properly following an unscheduled cessation of operation caused by:

6.4.1 Malfunction or significant adjustment, or

6.4.2 Mechanical, electrical, or operational modification, or

6.4.3 Environmental conditions that affected the operation, or any combination of the three.

6.5 The owner/operator will maintain appropriate water quality within an amusement ride or device where the guest can reasonably be expected to ingest or contact water volume sufficient to pose a substantial health risk.

7. Keywords

7.1 amusement rides; devices; notification bulletins; procedures

ANNEX

(Mandatory Information)

A1. SUPPLEMENTARY NOTIFICATION BULLETINS FORMAT

Issuing Entity Logo	Issuing Entity : Name Address City,State Zip Country Phone Fax E-mail Or Web Site	Bulletin No.: Release Date: Effective Date: Supercedes: Completion Date: Page: 1 of 1

SAFETY ALERT

Ride Manufacturer:	Affected Production Dates:
Ride Name:	Affected Serial Nos.:
Model Number:	

Abstract Of Issue:

Reason For Release:

Action To Be Taken:(Inspection, Modification, Replacement, NDT, Order Parts, Manual Revision, Procedural Change, etc.)

Detail Of Issue:
(Text/Drawings/Schematics)

FIG. A1.1 Safety Alert Bulletin

Issuing Entity Logo	Issuing Entity : Name Address City,State Zip Country Phone Fax E-mail Or Web Site	Bulletin No.: Release Date: Effective Date: Supercedes: Completion Date: Page: 1 of 1

SERVICE BULLETIN

Ride Manufacturer:	Affected Production Dates:
Ride Name:	Affected Serial Nos.:
Model Number:	

Abstract Of Issue:

Reason For Release:

Action To Be Taken:(Inspection, Modification, Replacement, NDT, Order Parts, Manual Revision, Procedural Change, etc.)

Detail Of Issue:
(Text/Drawings/Schematics)

FIG. A1.2 Service Bulletin

Issuing Entity Logo	Issuing Entity : Name Address City,State Zip Country Phone Fax E-mail Or Web Site	Bulletin No.: Release Date: Effective Date: Supercedes: Completion Date: Page: 1 of 1

NOTIFICATION

Ride Manufacturer:	Affected Production Dates:
Ride Name:	Affected Serial Nos.:
Model Number:	

Abstract Of Issue:

Reason For Release:

Action To Be Taken:(Inspection, Modification, Replacement, NDT, Order Parts, Manual Revision, Procedural Change, etc.)

Detail Of Issue:
(Text/Drawings/Schematics)

FIG. A1.3 Notification Bulletin

Issuing Entity Logo	Issuing Entity : Name Address City,State Zip Country Phone Fax E-mail Or Web Site	Bulletin No.: Release Date: Effective Date: Supercedes: Completion Date: Page: 2 of 2
Ride Manufacturer:	Affected Production Dates:	
Ride Name:	Affected Serial Nos.:	
Model Number:		
Detail Of Issue Continued:(Text/Drawings/Schematics)		

FIG. A1.3 Notification Bulletin *(continued)*

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